

Application No. 10/807,025
Docket No. 200315570-1

REMARKS

The present remarks are in response to the Office Action of July 25, 2007. Claims 1-6, 8-9, 11-19, 21-26, and 28-29 are currently pending.

Reconsideration of the application is respectfully requested in view of the following responsive remarks. For the Examiner's convenience and reference, the Applicant's remarks are presented in the order in which the corresponding issues were raised in the Office Action.

In the Office Action, the following rejections were issued:

- (1) Claims 21-26 and 28-29 were rejected under 35 U.S.C. 102(e) as being anticipated by U.S. Patent Publication No. 2005/0027035 of Wang et al. (hereinafter "Wang") in view of evidence given in U.S. Patent No. 5,571,311 to Belmont et al. (hereinafter "Belmont");
- (2) Claims 1-3, 6, 8, 11-13, and 16-18 were rejected under 35 U.S.C. 103(a) as being unpatentable over U.S. Pat. No. 6,214,100 (hereinafter "Parazak") in view of U.S. Pat. No. 5,889,083 (hereinafter "Zhu") and U.S. Pat. No. 6,874,881 (hereinafter "Suzuki");
- (3) Claims 4-5 and 14-15 were rejected under 35 U.S.C. 103(a) as being unpatentable over Parazak in view of Zhu and Suzuki, and further in view of U.S. Pat. No. 6,280,513 (hereinafter "Osumi");
- (4) Claims 9 and 19 were rejected under 35 U.S.C. 103(a) as being unpatentable over Parazak in view of Zhu and Suzuki, and further in view of U.S. Patent Publication No. 2002/0198287 (hereinafter "Ohta");
- (5) Claims 21-23, 26, and 28 were rejected under 35 U.S.C. 103(a) as being unpatentable over Parazak in view of Zhu;
- (6) Claims 24-25 were rejected under 35 U.S.C. 103(a) as being unpatentable over Parazak in view of Zhu, and further in view Osumi;
- (7) Claim 29 was rejected under 35 U.S.C. 103(a) as being unpatentable over Parazak in view of Zhu, and further in view of Ohta;
- (8) Claims 1-3, 6, 8, 11-13, and 16-17 were rejected under 35 U.S.C. 103(a) as being unpatentable over Parazak in view of Zhu, and U.S. Patent No. 6,652,055 to Oikawa et al. (hereinafter "Oikawa");

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- (9) Claims 4-5 and 14-15 were rejected under 35 U.S.C. 103(a) as being unpatentable over Parazak in view of Zhu and Oikawa and further in view of Osumi; and
- (10) Claims 9 and 19 were rejected under 35 U.S.C. 103(a) as being unpatentable over Parazak in view of Zhu and Oikawa, and further in view of Ohta.

Claim Rejections - 35 U.S.C. § 102

The Examiner has rejected claims 21-26 and 28-29 under 35 U.S.C. § 102(e) as being anticipated by Wang in view of evidence in Belmont. Wang discloses the use of styrene-maleic anhydride to control black-to-color bleed in ink-jet ink. There is no disclosure in Wang directed to jetability of inks as related to print head firing frequency. The ink to which independent claim 21 and its dependent claims are directed is reliably jettable at all firing frequencies from 3 kHz to 25 kHz. This characteristic is a limitation of the claims in addition to the listed ink component elements. Therefore to anticipate these claims, a prior art reference must teach the firing frequency limitation as well.

The Examiner has apparently treated this characteristic as merely an intended result, rather than as an actual limitation. Those having skill in the art can appreciate that reliable jetting across such a wide range of frequencies is not a common characteristic in ink-jet inks. Consequently, one skilled in the art will also recognize that not every formulation based on a combination of components will exhibit the same frequency response. Given a particular combination, one skilled in the art may create a number of formulations having a given frequency response profile, where the response profile is achievable by adjusting relative proportions of the components based upon their individual properties. Similarly, the same approach can be used to arrive at a number of formulations having very different characteristics from the first set. Therefore, for a claim reciting a list of components, ranges of amounts, and frequency response characteristic(s), some combinations of amounts of components will yield inks upon which the frequency response recitation will read, while other combinations will not. As such, the frequency response characteristic is a limitation on the scope of the claim that alerts one skilled in the art as to which of the many possible formulations are encompassed by the claim.

It follows that a disclosure that teaches the components without also explicitly teaching the frequency response characteristic cannot be said to be definitively disclosing that

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characteristic. At most, there is a mere possibility that the frequency characteristic is present in the disclosed formulations. However, the Federal Circuit has clearly stated that inherency cannot be established by possibilities or probabilities. See, e.g., *In re Robertson*, 169 F.3d 743, 745 (Fed. Cir. 1999). Here, the Wang reference does not teach that the inks disclosed therein are reliably jettable at firing frequencies from 3 kHz to 25 kHz as required by the present claims.

The Applicants therefore submit that Wang does not anticipate claim 21 because it fails to disclose every element of the claim. Consequently, Wang also does not anticipate the claims depending from claim 21, in that they each include all of the limitations of claim 21. Applicants respectfully request that this rejection be withdrawn. Applicants also hereby state for the Examiner's information that the Wang reference and the present invention are commonly owned, so Wang is not available for use in a rejection under § 103. MPEP 706.02(1)(1).

Claim Rejections - 35 U.S.C. § 103

The Examiner has rejected all of the pending claims under 35 U.S.C. § 103(a) based on various combinations of Parazak, Zhu, Suzuki, Oikawa, Osumi, and Ohta. Applicants submit that these rejections do not establish a case of *prima facie* obviousness because none of these references teach each and every claim limitation of the instant application. Particularly, none of the above-mentioned references teach or suggest the modification of the inks described therein to achieve a frequency printing rate that can span into the range of 15 kHz to 25 kHz (as well as be similarly printable along the entire range of 3 kHz to 25 kHz), as required by independent claims 1, 11, and 21. Because none of these references teach or suggest each and every claim limitation, Applicant respectfully requests that the obviousness rejections based on these references be withdrawn. Each rejection uses at least two of the following references: Parazak, Zhu, and Suzuki. As such, these references are briefly outlined below.

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Parazak

Parazak discloses an ink-jet ink directed to ester modified macromolecular chromophores. See col. 2, lines 22-32. As noted by the Examiner, Parazak can use a combination of solvents including ethoxylated glycerol, 2-pyrrolidinone, and 1, 5-pentanediol. See col. 5, lines 36-38.

Zhu

Zhu discloses an ink-jet ink suitable for printing on non-traditional substrates such as "glass, plastic, and metal" that are "scratch and rub resistant." See col. 1, lines 4-9. Zhu further states that "there exists a need for aqueous jet ink compositions that can meet the low VOC regulations." Zhu accomplishes this objective by using an ink composition comprising water, a colorant, a binder resin, and a wax. See col. 2, lines 39-40. Zhu states that the binder resin is a "film former," see col. 4, lines 48-51; having a preferable concentration of 5% to 10% by weight. See col. 6, lines 31-43. Zhu further states that the "organic solvent is preferably used in small amounts" to accomplish the low VOC purposes; teaching a concentration below 20%, preferably 0.1% to about 10%, and more preferably about 1% to about 5%. See col. 8, lines 66-67; col. 9, lines 1-6. As noted by the Examiner, Zhu discloses the use of a styrene-maleic anhydride resin. See col. 5, lines 57-67.

Suzuki

Suzuki discloses an ink-jet ink suitable for high speed printing comprising water, a water soluble coloring material, a resinous dispersant, glycerin, ethylene urea, and polyoxyethylene alkyl ether. See col. 3, lines 6-17. It is worthy to note, that the glycerin and ethylene urea "are critically important components" to maintain an ink capable of such printing. See col. 5, lines 64-67. While the ink is directed to certain printing frequencies, Suzuki specifically states that the ink can achieve 5 kHz or 10 kHz but has an "upper limit" of "about 15 kHz in practice." See col. 10, lines 32-44.

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Claims 1-6, 8-9, and 11-19

Each of the independent claims recite that the ink is capable of printing at a frequency along the entire spectrum ranging from 3 kHz to 25 kHz. For the first three 103 rejections, the Examiner has used at least Parazak, Zhu, and Suzuki in combination to reject independent claims 1 and 11.

The Examiner has cited the Suzuki reference to provide the requisite teaching of high-frequency printing. However, as noted above, Suzuki specifically teaches that the high speed printing frequency has an upper limit of about 15 kHz. As such, the combination would have no likelihood of success in producing the system, method, or ink of the present invention. The Examiner has responded that Suzuki states that the drive frequency is "not limited" and that the frequency has been increased to 10 kHz or higher. The Examiner has also asserted that, in light of this statement, it would be obvious to one of ordinary skill in the art to utilize a printer with firing frequency up to 25 kHz. Applicants would point out, however, that obviousness rejections must be based on findings of how a person of ordinary skill would have understood prior art teachings. Applicants submit that the teaching of Suzuki, taken as a whole, states an upper limit of about 15 kHz and therefore serves to discourage one skilled in the art from utilizing a printer having a higher speed. Further, Suzuki does not address the issue of providing an ink that reliably prints across a large range of frequencies, i.e. 3 kHz to 25 kHz.

The Examiner refers to the market demand for higher speed printing described in Suzuki. However, existence of such a demand in any art does not invite one simply making an obvious combination to disregard the state of knowledge in the art regarding the limitations of known materials. Applicants submit, therefore, that combining a printer having a firing frequency up to 25 kHz with the ink teachings of the other cited references would not be obvious to one of ordinary skill in the art. Even if made, such a combination would not yield the present invention; given the failure of all of the references to expressly or inherently teach reliable jetability across the frequency range required by the present claims (see discussion above), i.e. from very low to very high frequencies with reliability within a specific parameters.

In another set of rejections of independent claims 1 and 11, the Examiner has cited Oikawa to provide a teaching of a high-frequency print head. While Oikawa does refer to increasing heater driving frequency to several tens of kHz, the language cited simply refers to a

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general trend in meeting demand for faster printing without indicating the feasibility of any given frequency range. In fact, the reference goes on to discuss the limitations encountered when increasing frequency, e.g. the growing conflict between control pulse width and firing period eventually lead to ejection failure. Col. 3, lines 7-11. In any event, Oikawa does not remedy the deficiency of Parazak and Zhu with regard to teaching an ink that is reliably jettable at all firing frequencies from 3 kHz to 25 kHz.

As Parazak and Zhu combined with either of Oikawa or Suzuki fail to provide each and every element of independent claims 1 and 11, Applicants submit that a *prima facie* case of obviousness against these claims is not supported. Furthermore, the other references cited against the claims depending from these do not remedy the deficiency of Parazak, Zhu, Oikawa, and Suzuki. The Applicants respectfully request that the current rejections be withdrawn.

Claims 21-26 and 28-29

The Examiner has used the combination of Parazak and Zhu to reject claims 21-26 and 28-29, asserting again that the combination provides an ink that is intrinsically reliably jettable at all firing frequencies from 3 kHz to 25 kHz. The Applicants reiterate their positions discussed above with regard to the firing frequency characteristic as an actual limitation of the claims, and incorporate those arguments here by reference. Each limitation must be disclosed in the prior art references to support a case for obviousness. Neither Parazak nor Zhu teach the frequency characteristic required by the present claims. Furthermore, such a teaching is not inherent or intrinsic to either of these disclosures. As such combining them does not yield the present invention, nor is the combination itself obvious to do so. In the present combination, the Examiner has chosen one specific polymer from a list of polymers in Zhu. Nothing in Parazak suggests that a styrene-maleic copolymer would be particularly useful for high speed printing or for ink compositions in general. As the combination of Parazak and Zhu does not provide each and every element of the pending claim set, the Applicants respectfully request that the current rejections be withdrawn.

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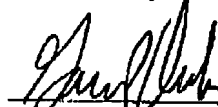
CONCLUSION

In light of the above, Applicant respectfully submits that pending claims are allowable over the cited prior art. Therefore, Applicant requests that the rejections and objections be withdrawn, and that the claims be allowed and passed to issue. If any impediment to the allowance of these claims remains after entry of this Amendment, the Examiner is encouraged to call Gary Oakeson at (801) 566-6633 so that such matters may be resolved as expeditiously as possible.

The Commissioner is hereby authorized to charge any additional fee or to credit any overpayment in connection with this Amendment to Deposit Account No. 08-2025.

DATED this 22nd day of October, 2007.

Respectfully submitted,



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